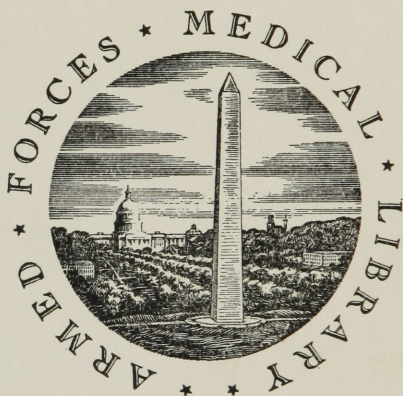


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INAUGURAL DISSERTATION

ON

LITHOTOMY.

SUBMITTED TO THE EXAMINATION OF THE

REV. JOHN ANDREWS, D. D. PROVOST.

THE TRUSTEES AND MEDICAL FACULTY OF THE UNIVERSITY OF
PENNSYLVANIA.

ON THE TWENTY-FIFTH DAY OF APRIL, 1811.

FOR THE DEGREE OF DOCTOR OF MEDICINE.

BY MICAJAH CLARK

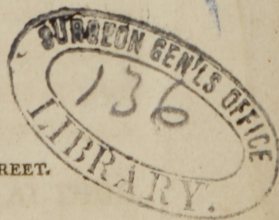
OF VIRGINIA.

HONORARY MEMBER OF THE PHILADELPHIA MEDICAL SOCIETY.....MEMBER OF
THE PHILADELPHIA LINNEAN, AND HONORARY MEMBER OF THE
COLUMBIAN SOCIETY OF VIRTUOSI, PITTSBURGH.

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1811.



INAUGURAL DISSERTATION
TO
JOHN ADAMS, M. D. OF RICHMOND, VIRGINIA,
AND
JOHN SYNG DORSEY, M. D.

ADJUNCT PROFESSOR OF SURGERY, IN THE UNIVERSITY OF PENNSYLVANIA.

I SHOULD do injustice to my feelings, were I not in this public manner, to return you my warmest acknowledgments for the many opportunities of instruction you have afforded me, both in the practice of Medicine and Surgery ; and also for the many civilities and uniform attention manifested towards me, while under your instruction.

In consideration of which, and for the professional talents, and many amiable virtues, which adorn your characters ;

This Essay is respectfully inscribed,

By your very grateful,

Obliged friend

And Pupil,

THE AUTHOR.

ON

LITHOTOMY.

I SHALL prefix to my observations on this subject, a succinct history of the operation.

No one, at all conversant with the healing art, is ignorant, that Lithotomy has always been considered one of the most important of the capital operations of Surgery : indeed, such is the interest men in all ages have felt and taken in the success of this operation, that the various methods of performing it, have in general been faithfully recorded; evincing in a conspicuous manner, the important light in which it was viewed by the ancients, as well as the moderns ; and even so much so in the time of Hippocrates, as to induce that great man to require an oath from his pupils, never to perform it ! so sensible was he of its danger.

It would be unnecessary for me then, from these existing records, if the limits of an essay would permit, to lay before the reader, a minute detail of all the modifications and improvements the operation has undergone, since its first performance. But commencing with the time of Celsus, who flourished during the reign

of *Augustus* and *Tiberius*, and to whose writings we are indebted for the first definite record of the performance of this operation. I shall proceed to mention in a cursory and condensed manner, the different modes of operation, down to about the commencement of the eighteenth century.

The first mode of operating for the stone, of which we have any correct record, was by the *Apparatus Minor*, cutting upon the gripe, or *Lithotomia Celsiana*, so called in honour of its recorder.

Whether Celsus himself ever performed this operation is to be doubted; it is more probable that he has recorded it merely as a spectator to the operations of *Meges*, who was a *famous Lithotomist*, in the reign of *Augustus*. Although this record of Celsus, is the first definite one, we have on the subject, the operation was certainly performed several centuries before, by *Ammonius* of *Alexandria* in *Egypt*, during the time of *Herophilas* and *Eriristratus*; and was probably continued down by different *Lithotomists* to the time of *Meges*, when Celsus saw it performed.

As Celsus fully details the operation, I shall give it in his own words as translated. "Since I have in describing the introduction of the Catheter, mentioned the bladder of urine, and the stone, the occasion seems to require, that I should describe that operation which, when all other methods fail, must be performed on those who are afflicted with the stone; An operation which, since it is full of danger, must never be rashly performed." Celsus then goes on to mention, what

circumstances should forbid the operation, at what season of the year, and at what age, it should be performed ; and describes minutely the method of confining the patient, and his posture, so as to expose fairly the parts to be operated upon ; the surgeon having paired his nails, introduces his fore and middle finger per anum, and feels for the stone, ascertaining its form and size, then presses upon it, so as to be felt in the perinæum. Celsus then proceeds, “ Matters being thus prepared, an incision is to be made through the skin, down to the neck of the bladder, of a *lunated form*, not far from the *Anus*, and with the horns of the lunated incision, looking towards the hips, then in the deeper and narrower part of the wound, is to be made a second incision, also transverse, into the neck of the bladder itself, until the flowing out of the urine, shewing the incision to exceed in some degree the size of the stone.” The remarks of Celsus in continuation amount to this ; that if the stone be small, it is now to be withdrawn with the fingers, but if large a flattened hook, bent in a semicircular form is to be introduced behind the stone, and then withdrawn with a compound motion, from side to side, and directly forwards. Of the after treatment of the patient, I shall say nothing, it being my intention now, only to take a cursory view of the history of the operation.

Nothing of importance appears to have taken place in the history of Lithotomy for many centuries, until the time of Le Raoues, who operated for the stone in Nismes, Rouen, and Bourdeaux, with great success, which served to excite the rancour, jealousy, and malignity of different surgeons of his profession ; men

of the first eminence were found ready to ridicule and depress him ; and such for the *honour* of human nature, I am sorry to say, is too often the reception which genius and enterprize meet with.

About this time also Lithotomists changed the lunate for a longitudinal incision, still however “cutting upon the gripe,” directed at times by a staff. Among these were the famous Frere Jaques and Joanes Jacobus Raw.

A Biographical sketch of these Lithotomists, would be not only entertaining but interesting, the peculiar habits of Frere Jacques, the boldness and intrepidity with which he operated, the many reverses of fame, which his reputation as an operator sustained, mark him at once a prominent character in his profession ; it is necessary however to remark, that from his deficiency in Anatomical knowledge, his first operations were imperfect and unsuccessful until under the instruction of Fagon, Verney, and Felix, and by frequent dissection he formed a pretty accurate anatomical acquaintance with the parts to be operated upon. Then it was, and when aided by the staff, he performed his operations with unrivalled success, and approximated very nearly to the present mode of operating by many surgeons in England.

The advantages and disadvantages attending the Celsian operation I shall not dwell upon, but take the liberty of referring the reader to his own reflection, and to authors on the subject.

I now pass on to the operation of Joanes De Romanis or of Sanctus Marianus Barolitanus, by the apparatus Major, in contra-distinction to the apparatus Minor, so named from the number of instruments used.

This operation appears to have been first performed by Joanes De Romanis a surgeon of Cremona in Italy, and recorded by Marianus in 1524, from which circumstance it is sometimes called the *Marian operation*.

On perusing the work of Prosper Alpinus, I discover that about the same time, perhaps some short time afterwards, the Egyptians extracted stones from the bladder by *dilatation* alone. Alpinus observes, that in his travels through Egypt, he saw a certain *Arab* called *Hayli*, who practised it, but without making any incision at all, but by dilating the Urethra and neck of the bladder through its whole extent, by the introduction of wooden dilators, &c. This mode of extracting the stone, being painful and cruel to the highest degree, and so perfectly devoid of all science and reason, I shall take no further notice of it, but refer the curious to the work of Alpinus, in a dialogue between himself and Guildanus; and proceed to a description of the apparatus Major or Marian operation, which is detailed by Mr. J. Bell, in that voluminous and well written work of his, entitled "principles of surgery" "the operator resting on one knee made an incision with his razor, along the perinæum on one side of the *raphe*, and feeling with his finger for the curve of the staff, he opened the membranous part of the Urethra, and fixing the point of the knife in the groove of his staff, gave it to an assistant to hold, while he passed a

probe along the knife into the groove of the staff, and then into the bladder. The urine now flowed out, and the staff was withdrawn. The operator next took two conductors, a sort of strong iron probes, the one named a female conductor, having in it a groove like one of our common directors, the other a male conductor, having, a probe point corresponding with that groove. The *grooved* or *female* conductor being passed along the probe into the bladder, the probe was withdrawn, and the male conductor passed along the groove of the female, and into the bladder; then commenced the operation of dilating; the operator taking a director in each hand, and by making their shafts diverge, dilated or in plain language tore open the prostate gland."

These were the most simple instruments used; but when we consider and examine the more compound ones of Pareus, Le Dran and more particularly those of Le Cat, the mind turns from them, in dismay, and naturally enquires, what circumstance could induce professional men, and those too supposed expert, to perform so cruel and irrational an operation: the only reason which can be assigned for this, is the much abused aphorism of Hippocrates, that "wounds of membranous parts are mortal," not associating the fact at the same time, that laceration of membranous parts are still more so, which unfortunately for the sufferers under this painful operation too frequently occurred.

I shall not attempt to trace the various supposed improvements in these dilating instruments, when those

of Le Cat alone formed a considerable package, constructed for the performance of this too barbarous operation, nearly equalling that practised in Egypt, by the illiterate Arab. I might mention also that various complex instruments were constructed by the family of the Callots, Paré, Le Dran, Mareschall, Mer-ry and others of the Marian sect, for the performance of this operation, but to attempt a description of them would serve no useful purpose.

Notwithstanding the cruelty and danger attendant upon this mode of operating, it was tolerated and practised by most of the surgeons in Europe, for near two hundred years, and was the method principally practised when Frere Jaques made his appearance.

Of the *High operation*, or that performed above the pubis.

On reference to the observations of Mr. Sharp, we learn that this method of cutting for the stone, was first practised and published by Piere Franco in 1561, who performed it in one case with success, but for obvious reasons discontinued the operation afterwards.

This mode of operating has been highly recommended by Rosettus, although it appears he never performed it himself. It is also mentioned by Monsieur Tolet to have been performed at the Hotel Dieu in Paris, but not with sufficient success to merit its continuance.

From Mr. Chesselden we learn that in 1718, Dr. James Douglass in a paper presented to the royal so-

ciety, demonstrated from the anatomy of the parts, that the high operation for the stone, might be practised with success; yet no one attempted it, until his brother Mr. John Douglass, a few years afterwards, performed it much to the satisfaction of himself and spectators; but from subsequent failure it was soon for a time, laid aside. Mr. Chesselden observes that, "the ensuing season being his turn in St. Thomas's Hospital, he resumed the high operation, and cutting nine patients with success, it again became popular, but from the Peritonæum being frequently injured, and fatal consequences not uncommonly arising from it, together with many inconveniences it was again discontinued."

The operation, as described by Mr. Sharp and others, is as follows; "The patient being laid on a square table, with his legs hanging off, and fastened to the side of it, by a ligature passed above the knee, his head and body lifted up a little by pillows, so as to relax the abdominal muscles; and his hands held steady by some assistants: inject very gradually through the catheter into the bladder (unless the bladder be already sufficiently distended with urine) as much barley water as the patient can bear, which in a grown person is generally about eight ounces. The catheter is then to be withdrawn, and an assistant in order to prevent the escape of the water, is to grasp the penis: the surgeon then with a scalpel, is to make an incision about four inches long, between the *recti* and *pyramidales* muscles, through the cellular and membranous substance as deep as the bladder, carrying the lower extremity of the incision almost down to the penis; after this, taking

a crooked knife, continue the incision into the bladder, carrying it a little under the os pubis, and immediately on the waters flowing out, introduce the fore finger of your left hand, which will direct the forceps to the stone."

This is certainly one of the most simple and easy operations in Lithotomy, and where the bladder is large and distended, with a small stone, might in some cases be performed with safety. But the inconveniences generally attendant upon this method of operating, are such, as to induce modern surgeons to lay it aside; and for the following reasons they appear to have done so, very properly.

First. A stone in the bladder generally irritates that *viscus* so much, as to occasion its coats to thicken and contract, consequently its fundus drawn lower down into the pelvis, than natural, of course not susceptible of being elevated sufficiently above the pubis, either by the retention of urine, or the injection of barley water, to operate upon with safety.

Secondly. If the stone is large and broken, the fragments cannot be washed out, and remaining, serve as a nucleus for the formation of other stones.

Thirdly. From vicinity of parts, peritonæal inflammation, would in most cases supervene, the danger attendant upon which, are very great.

Fourthly. The incision would be made into the membranous part of the bladder, which would not so readily

heal, as one made in the prostate, from the alternate distension and collapse that viscus undergoes.

Having now taken a cursory view of the methods practised by different Lithotomists down to about the commencement of the eighteenth century, when Mr. Chesselden, aided by the observations made on the operations of Frere Jaques and Raw, adopted the true *lateral method* of operating. It might not be uninteresting to mention, that before this method was adopted by him, Albinus, a pupil of Raw, published his supposed method of operating; but the event circumstantially proved, that Albinus himself, although a private pupil, and frequently a spectator and assistant at Raw's operations, did not clearly comprehend the incision made by him into the bladder; for the operation of Raw, as detailed by Albinus, was explicitly followed by many surgeons, particularly the English; but not with the same success which marked the operations of Raw himself. This consequently gave rise to a warm contention, whether or not, the method described by Albinus, was the one which Raw actually practised, and which appears strengthened by the particular character of Raw; for notwithstanding his great celebrity, both at home and abroad, he fostered and retained to his last moments, very much of the empiric, even so much so as never to describe his true mode of operating: but on the contrary, whenever inquiries were made, he universally avoided giving a definite answer, by referring to the works of Celsus!

It is not my intention to note the different improvements of the operation, introduced by Chesselden himself; but shall only observe, that to his ingenuity,

talents, perseverance and accurate anatomical knowledge, we are indebted for the adoption, and the *then* supposed perfection of the *lateral method of operating*. A circumstance which I note with the greater pleasure, from the openness and candour with which he communicated it to all who wished information on the subject.

Neither is it my intention to notice particularly, the various modifications which took place through the ingenuity of others, not so much in the operation itself, as the instruments used to perform it, for the cutting gorget of Sir Cæsar Hawkins, the scalpel and bistoury, are now the principal instruments used for making the lateral incision into the prostate gland. I would however briefly mention, that Foubert, a respectable surgeon in Paris, constructed a kind of trocar for the purpose. That Le Cat, whose inventive genius for the construction of instruments, always playing above his better understanding, constructed knives and cystomes, one of them called the *gorgeret cystome—dilatoire—composé*, from its great complexity. And that Frere Cosmé constructed, the *bistouri caché*, an instrument still used by some very respectable surgeons and Lithotomists. I deem it unnecessary to offer any comments at present upon these instruments, for time and experience have consigned most of them to the cabinets of their constructors, and they are not likely again to come into notice. Of the *bistouri caché* of Cosmé however, some remarks might be expected; if so, suffice it to observe, that from the uncertainty of the size of the incision made by it, danger and inconvenience must be always apprehended from its use, and which must be ap-

parent to every candid and impartial observer ; for an instrument not under the immediate guidance and influence of the hand of an operator, but under that of an artificial spring, must be attended with doubtful consequences, when exercised in parts so deep seated, as not to be aided by the eye.

Having taken this cursory view of the lateral operation, I shall pause for a moment, in the selection of an instrument, best calculated for making the incision into the bladder.

The gorget, in its original imperfect and blunt form, was known and used, long before the time of Sir Cæsar Hawkins, as a simple dilator ; the circumstance which induced him to sharpen and use it, as a cutting knife, appears to have been accidental, for in performing an operation on the dead body, he happened to use a gorget, which from time or frequent use, had become rusty on one side, and succeeding better in this operation than he had been accustomed to, he was led to an investigation of the instrument, which on examination he found had received in a manner a cutting edge from the circumstance mentioned : this induced him to sharpen the instrument, and use it as a knife, which on trial he found to exceed his most sanguine expectation :* from this time, the instrument came into notice, and has been since, variously modified and improved by different surgeons, until it has attained its present state of perfection. Several surgeons however, of distinction in England,

* Physick's M. S. S. Lect.

have lately made many objections to its use, and decided in favour of the scalpel and bistoury. These objections I shall next examine; and I hope to prove, that they are in every respect fallacious, and that the gorget ought still to hold the decided preference over every other instrument.

The first objection which has been urged against the use of the cutting gorget, is the danger of thrusting the instrument on between the bladder and rectum, not passing it into the cavity of the bladder at all.

In answer to this, I would observe, that this accident can certainly never occur to one, who has an accurate acquaintance with the anatomy and relative situation of the parts, and who passes the gorget on in its proper direction, observing that its beak glides smoothly in the groove of the staff. For every operator of the present day knows, that when the operation is correctly and properly performed, the prostate gland is divided laterally, or nearly so, and not backwards in the direction of the rectum. If he therefore inclines, in passing the gorget, so far backwards, as to pass between the bladder and rectum, it is the fault of the operator, and not of the instrument itself.

But it appears from the observations of several surgeons of distinction in Europe, that the gorget has, in some instances passed in this direction, and that too, when in the hands of able operators. This I shall not attempt to deny; but would observe, that unwarrantable carelessness is the only explanation, and a careless operator would be much more apt to do this mischief

with a scalpel or bistoury, than with a gorget ; because the latter instrument, unless forced out of the groove in the staff by very great awkwardness, could never be liable to this accident. The former instrument having no beak fitted to the groove, would be much more readily forced in an improper direction.

A second objection is, that the staff has been bent by an “over attention” to keep the beak of the gorget in the groove.

This must have arisen from an “over-attention” indeed, and that too, aided by a force perfectly inexcusable in any operator ; for every experienced surgeon always takes the precaution, before passing the gorget, to ascertain whether it glides easily along the groove, and that it is not arrested in its passage by any inequality or roughness, a point never to be omitted in the operation of Lithotomy ; and one which does away all danger of this accident.

A third objection is, that the gorget being an instrument of no inconsiderable bulk, must be wedged with some firmness in the wound it makes. This will prevent the operator from feeling with accuracy, when it has entered the bladder, and by pushing it on, he may wound the fundus of that viscus.

The first part of this objection, is easily answered. A cutting *instrument* passing through as solid a *substance* as the prostate gland, into the cavity of the bladder, would always afford a sensation to the hand of the operator, enabling him to ascertain when it has passed into the cavity of that viscus. But, independent of this,

the flow of urine would always inform him, when he had proceeded far enough, for the instrument is not wedged in so close, as to prevent the escape of this fluid.

The latter part of the objection, or that relating to wounding the fundus of the bladder, appears at first, to bear more force with it, but is in reality, equally futile; for in the passage of the gorget, every operator would take care not to pass it into the bladder, when the *fundus* of that *viscus* was pressed down by any abdominal exertion. And rash to the extreme, would be the movements of that surgeon, who would force the instrument so far on, as to injure the *fundus* in a natural quiescent state: besides, before the operation, the patient is always directed to retain his urine for a few hours, which very effectually prevents any collapse of the bladder, of course the *fundus* is kept at a considerable distance from the *prostate*.

A real and cogent objection has been pointed out by Dr. Physick, against the use of the gorget of Sir Cæsar Hawkins, resulting from its particular construction, that part of it near the beak, cannot receive a sharp edge, and consequently serious inconveniences and embarrassments have resulted from its use. It is that part which commences the incision, and if it be not very sharp, the urethra is carried before it, and thrown into folds, before the blade, and when the instrument enters the bladder, it enters with a jirk, and often endangers the wounding of parts not necessary to be cut.

I feel happy in observing, that the difficulty has been fully obviated by Dr. Physick, who has improved upon the gorget of Hawkins in such a manner, that the

cutting part of it may be separated from the beak, and is of course as susceptible of receiving a sharp edge, as any other cutting instrument whatever....For an account of this improvement, I refer the reader to the first volume of the Philadelphia Medical Museum.

Another objection has been urged, that the *internal pudic artery*, is more liable to be cut with the gorget, than with the knife.

And still another, that the incision made by the gorget in the *prostate gland*, and neck of the bladder, is too small. These appear to me, to refute each other. Leaving it however, to the reflection and decision of the reader, I go on to observe that the incision is generally large enough. But if the stone should be of a very large size, the incision in the prostate and neck of the bladder may be very conveniently enlarged with a scalpel or bistoury.

I cannot leave the subject of the gorget, without noticing a remark made by Mr. Charles Bell in his operative surgery "that the groove of the staff, should have a slight roughness, so as to enable the surgeon better to ascertain, when the beak of the gorget was in it." This appears to me, inconsistent with the nature and use of the instrument, for to facilitate and insure the success of the operation, the beak of the gorget should pass easily on in the groove. For what would have a greater tendency to embarrass and foil the operation, than for the beak of the *gorget* to be arrested and thrown out of its direction in its passage, by any inequality in the *groove*; and it is probable that from inattention to this circumstance, some of the objections against the gorget have arisen.

Having now taken under consideration the objections urged against the use of the *gorget*, I shall next notice the *Scalpel*, an instrument used by several surgeons of eminence in Europe, particularly by Mr. John and Charles Bell for the purpose of dividing the *prostate gland*, and neck of the bladder, in preference to the *gorget*. To the use of the scalpel I object, first. That from the delicacy of the point of the knife, it cannot be passed on in the groove of the staff, with as much steadiness as the beak of the *gorget*, but will turn from side to side in the groove, making a ragged and irregular incision. And should this be attempted to be obviated, by making the groove of the staff narrow, so as to fit the blade of the knife, it would wrest from the hand of the operator, that perfect command of the knife, which it is necessary for him to have in making the incision.

Secondly. From the delicacy of the point of the knife, if it meets with the smallest inequality in its passage, the point would, in all probability break off, from which serious embarrassments would result to the operator.

Thirdly. The passing of the fore finger as directed, along the back of the knife so near the point, in parts so deep seated, would have the effect of pressing them forwards before the knife, and in this way incommode the operator, and impede a clear and free incision being made, through the *prostate gland* and neck of the bladder.

I cannot close these remarks without declaring the *gorget* to be a scalpel admirably adapted for the purpose intended. It has many advantages over the com-

mon scalpel, and is liable to fewer objections. By it the neck of the bladder can be divided with great safety and certainty, and the incision may be made of any requisite size. Let us in comparing the gorget with the scalpel, inquire, what directs these instruments into the bladder? It is the groove of the staff. Which is best adapted to this groove, the beak of the gorget accurately fitted to it, or the sharp point of a common scalpel? The answer is evident; the gorget must keep its course unless averted from it by great negligence. The scalpel can only be maintained in its direction by great attention and difficult management.

It might not be improper in this place, also to notice an instrument for dividing the *prostate gland*, and neck of the bladder, constructed by Mr. T. Blizard, modestly called a *bistoury*, and used by him in the London Hospital. Upon examination of this instrument, it will be found in every respect (except utility) a cutting gorget, but of such inconvenient and awkward construction as scarcely to merit serious attention. This instrument by its advocates, has been supposed to combine the advantages both of the gorget in having a beak, and of a common knife or straight bistoury in having a narrow blade. This combination appears to me irreconcilable upon every principle of the operation; for if the operator should choose a knife, for the performance of this operation, let him select one less clumsy in structure, and more convenient to handle. If on the other hand, he should give the preference to a gorget, let him take hold of one well constructed, and in every respect best calculated for making the incision, and such in my opinion, he will certainly find the cutting gorget of Sir Cæsar Hawkins improved by Dr. Physick.

OF THE OPERATION.

IN performing an operation which so immediately involves the life of the patient, and the reputation of the surgeon, as Lithotomy, we should be careful in ascertaining the general health of the patient, and minutely enquire into his particular situation at the time. For it is only when the patient has had an interval of ease after a paroxysm of pain ; when he has rested tolerably well ; when his system is free or nearly so, of irritation and fever, and in no danger from the infection of any reigning epidemic, that we can venture to perform the operation.

It is not necessary as the ancients supposed, to wait for a particular season, but in a temperate climate, may be performed at any time, very hot weather excepted. It would be desirable for the surgeon to spend as much time with the patient, some few days before the intended operation as possible, guarding his health, and preparing his system for it, by affording him nourishing diet, if his system is much debilitated, and by necessary depletion, if the contrary.

In all cases of operating for the stone, it is important to procure the aid of an assistant surgeon, in fact almost indispensable, for by him, the opinions of the operator will be strengthened and he will also be relieved

from any embarrassing circumstance, which might occur during the operation.

A few hours before the operation is to be performed an enema should be administered, the perinæum shaved, and the necessary apparatus prepared; about an hour previous to it, an anodyne should be given.

Every thing being now ready for the operation, the patient is placed on the *table*, and the staff introduced, he is then laid on his back, with his *nates* presented fairly over the end of the table, his feet drawn up and grasped with his hands, so that his knees are drawn upwards, obliquely from his breast; in this posture he is to be confined with the fillets, by passing them around his hands and feet; an assistant then standing on each side of him, is to place the patients knee in his axilla, passing his hands down to hold his feet; another is to be placed at his head and shoulders, to keep him from moving.

The surgeon now seats himself at a convenient height, and taking the handle of the staff presses it a little towards the right groin, so that the convexity of the staff is felt in the *perinæum*, he then gives it to an assistant, who holds it firmly in the position he received it, having the *thumb* of his left hand, over the head of the staff, and supporting the scrotum with his right. The holding of the staff in its proper situation, being a point of considerable importance, should be always confided to the care of a skilful assistant.

The surgeon having canvassed in his mind, the anatomy and relative situation of the parts, and particularly felt the prominence of the *ischium*, remembering that the margin of that *bone* extends somewhat more inward than the prominence which he feels, (for inattention to this circumstance, might endanger the *pubic artery*;) then lays his left hand over the *right buttock* of the patient, so that the palm, rests on the *tuber ischii*, spreads out his fingers on the *perinæum*, and with the end of his fore finger at the root of the *scrotum*, feels the heel of the staff, then drawing the skin of the *perinæum* with his fingers to give it tension, and marking with his eye the direction of the incision, he takes the scalpel in his right hand, which he holds in the form of a writing pen, with his thumb and three fingers, begins the incision about an inch behind the *scrotum*, and carrying it downwards, declining regularly towards the left hip, passes on between the *tuber ischii* and *anus*, to the distance of about an inch, or an inch and a half beyond the *anus*, so as to form an incision when completed, about three and a half inches in length, more or less according to the size and corpulency of the patient. The fingers of the left hand, which at first kept the skin tense, are now withdrawn for another use. The fore finger now guides the knife, and the operator proceeds to dissect through fat and cellular substance, muscular and ligamentous fibres, until the wound is laid free and open.

When the *hollow* between the *tuber ischii* and *perinæum* is freely laid open, the external incision is completed, and the operator begins to feel for the

staff, which being found and distinctly felt, takes the sharp pointed bistoury and makes an incision about three quarters of an inch long, through the membranous part of the urethra into the groove of the staff, carefully observing, that the part is completely incised, and no fibres left to entangle the beak of the gorget. Now comes the most important part of the operation, and that which requires the concentration of the operators whole attention; having fairly exposed the groove of the staff, he lays down the bistoury, and takes up the gorget, which he introduces with care, and in its proper direction through the wound, until its beak is fairly lodged in the groove of the staff, he then passes it backwards and forwards along the groove several times, to ascertain whether it passes smoothly along in it; the surgeon now rising from his seat, passes on the gorget, recollecting the convexity of the staff, and that he is to pass the gorget in the direction of the axis of the pelvis, not directly onward, he moves slowly at first, until he discovers the urine trickling on the instrument, when he carries it more resolutely onward, lest the urine should escape altogether from the bladder, and endanger wounding the fundus. Some have advised the staff now to be withdrawn, and the gorget to remain in as a director for the forceps, but from the reason of the case, and from the best authority this should be reversed. The gorget is to be immediately withdrawn, in the same direction it entered, the forceps introduced, and *then* the staff withdrawn: the surgeon is now to elevate the forceps which he uses as a searcher, and feels about for the stone, which he will probably

find in the most depending part of the bladder, when found he is to open the handles, taking hold of one in each hand, and takes hold of the stone, then disengaging one hand, he introduces his fore finger, and places the stone in the most convenient situation to be withdrawn, then in the direction of the incision, and with a compound motion from side to side and directly forwards, withdraws the forceps, bringing along the stone. But if a convenient hold cannot be obtained upon the stone, the scoop or third lever, should be introduced, which constituting an instrument acting on three points, will greatly facilitate its extraction.

After the stone is extracted a diligent search should be made, to discover whether others remain; which if found, should be extracted in the same manner. After the operation the bladder should be carefully syringed, to wash out any fragments of stone which may have been broken off.

Observations might now be extended on the supposition of the incision in the prostate gland, and neck of the bladder not being large enough, for the extraction of the stone? If so, let it be enlarged with the probe pointed bistoury.

That from the size of the stone, it is necessary to break it? If so, let him use the large forceps and extract by piecemeal.

That the internal pudic artery has been divided? Whenever this accident occurs, let the surgeon with his finger in the wound, feel for the pulsation of the artery, at the place where it crosses the *ramus of the ischium*, and introduce the *tenaculum*, passing it between the bone and finger, including the vessel with a portion of the *flesh* which surrounds it, then by passing a ligature around the part supported by the *tenaculum*, and tying it, will be enabled to make all necessary compression, and command the *hæmorrhage*, without much difficulty.*

Or he may use what in most cases will be found easier, an armed needle, supported by a pair of small curved *forceps*, constructed and used by Dr. Physick, for the purpose of taking up deep seated vessels, and which is particularly recommended by him, for securing this artery, in case it should be wounded.†

This instrument is so well calculated for the purpose of taking up the *internal pudic artery*, that I cannot too strongly recommend to every surgeon, to provide himself with one, before he proceeds to perform this operation. For so confident am I, of its convenience and utility in case of an accident of this kind, that if this essay should possess no other merit than the recommendation of this instrument, I should consider myself well rewarded for the time spent in preparing it.

* Physick's MSS. Lectures.

† *Ibid.*

Every thing being accomplished to the satisfaction of the surgeon, the patient is to be placed in bed, and a folded sheet laid under him, to absorb the urine &c. which shall escape from the wound; the wound is then to be superficially dressed, and his thighs drawn close together. The object of the surgeon being now to promote the healing of the wound from the bottom, and preventing external adhesions, he should take such steps as will most effectually accomplish this purpose. And also by necessary precautions, guard the patient's system against symptomatic fever, and peritoneal inflammation.

The operation as performed on females, being so very simple, I deem it unnecessary to lengthen this essay, by giving a description of it; but shall refer the reader to authors on the subject.

In selecting a subject for an inaugural dissertation, of such moment as the operation of Lithotomy, I am well aware that I may incur the censure of the learned profession, but from their liberality, I crave indulgence, and offer as an apology, the *operations* I have seen performed, and the *lectures* I have heard, replete with information, from the professors of surgery, and also my great predilection for the profession, as one of the most important branches of medical science.

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